

REMARKS

Applicant appreciates the Examiner's withdrawal of the finality of the previous office action.

The above amendments address the 35 U.S.C. 112, second paragraph rejections.

Original claim 3 has been cancelled without prejudice. The amendment to claim 1 incorporates the subject matter of claim 3. No new matter has been added, nor any new issues raised, by the amendments and the foregoing response.

Claims 1, 4, 5, and 11 are pending.

Drawing Objection:

The above amendment to the subject matter of claim 3 added to claim 1 defines that the sensor means are "along" the circumferential direction.

Figure 4 shows that the sensors 74, 76 are mutually displaced "along" the circumferential direction of the main shaft.

Reconsideration and withdrawal of the drawing objection is respectfully requested.

Claims 1, 5, and 11 are patentable under 35 U.S.C. 103(a) over Irie et al (DE 3909772 A1) in view of Winkle (U.S. Patent 5,698,031).

Irie does not teach nor suggest that the reference means should be used in connection with the main shaft nor that the reference means be a direct or indirect indication of the position of the main shaft and thereby the position also of the piston. Moreover, Irie does not disclose

that the sensor means is used for detecting the position of the reference means and thereby detect the angular position as well as angular speed of the main shaft.

Irie cannot render the claims of the present invention obvious at least because it fails to teach or suggest all the claim limitations. Reference is especially made to column 1, lines 66-67. No mentioning of electrical powering of the pump shaft is found. Instead, there is a disclosure for a main shaft which is driven electronically in order to provide oil in an amount and timing which is correct.

Moreover, it occurs from column 3, lines 49-56 that the system is based on a synchronous driving of the oiling plant shaft 3 and the rotation of the motor. Such special situation of driving is directly contrary to the technical effect obtained with the present invention that allows synchronized cylinder lubrication as well as a non-synchronized cylinder lubrication.

The Examiner has specified that "Irie does not distinctly disclose the type of motor used to operate the lubricating device".

Irie mentions detectors for rotational speed of the drive shaft 3 and a detector to adjust the angle for the manual handle 2 arranged on the lubrication plant in order to adjust the shaft 29 thereof. Manual handle 2 dictates the quantity of oil supplied (Col. 3, lines 54 - 56).

Moreover, the citation also mentions a phase detector for detecting the phase of the drive shaft 3 and a detector for the angle of the motor crank shaft. There is no mentioning of the way in which these sensors function and there is no mentioning of reference means connected to the main shaft in order to indicate the position of the piston.

Furthermore, it should also be noted that Irie does not disclose that the lubricating device (21) is driven by a motor. Irie relates to a lubricating device (21) with a shaft (3). It is also stated that the drive shaft of the marine engine (1) rotates synchronously with the speed of the

engine. This is also correct. However, it occurs that the shaft (3) is actually the shaft from the lubricating device (21) and the shaft of the lubricating device (21) will normally be connected mechanically with the main shaft of the engine when a synchronous rotation is obtained. This is already explained in the description of prior art in the present application.

Therefore it is clear that Irie does not have any teaching of a motor at all in order to operate the lubricating device. What would be the expected situation in the technology taught by Irie is that the lubricating device is driven through a mechanical connection with the main shaft of the engine in which the cylinders are to be lubricated.

Therefore Irie is clearly different from the present invention which is based on the idea of disconnecting the mechanical engagement with the main shaft of the engine and instead drives the lubricating device (21) with a separate AC motor.

Moreover, it seems as if the Examiner has overlooked the differences between the invention as defined in present claim 1 and the teaching of Irie, specially the features relating to earlier claim 2 that has been added to claim 1 which defines the invention over Irie.

In Irie there is no teaching of any reference means which should be connected with the main shaft of the engine and to thereby, directly or indirectly, indicate the position of the main shaft and thereby also the position of a piston in the engine to be lubricated.

Going through Irie there is found no description of any reference means either in connection with a main shaft or any other element of the engine to be lubricated.

Therefore Irie does not teach such reference means, and accordingly, it could neither be said that Irie teaches sensor means which detects the position of such reference means.

Therefore, Irie does not disclose, teach or suggest sensor means as disclosed in the present invention for detecting the position of the reference means.

Even if Irie may provide a sensor 6 which is an angle sensor, yet, sensor 6 is used to give an indication of the position of the handle 2 which is used for increasing or decreasing the supplied amount of lubrication oil through different adjustment of the angle of the handle 2.

Even if Irie provides a crank angle detector 8, yet, there is no specific explanation of the type of detector used. Moreover, it is clear that it is a detection of the crank angle, which not necessarily is based on the use of a reference means, which is connected with the main shaft (crank shaft) of the engine. Therefore the mere mentioning of a crank angle detector (8) does not necessarily disclose that the reference means are provided in a system disclosed by Irie.

Even if Irie teaches a number of converters either A/D or D/A converters, yet, these converters only make it possible to detect the speed, direction of movement and position of the engine piston. It occurs e.g. from column 4, lines 6-17 that the converters are simple devices for transferring an analog signal to a digital signal or vice-versa.

Irie expressly states that they should be connected with the crank angle detector and the engine speed detector. Even though the engine speed detector could be said to be a signal for the speed of the engine and it also could be said that the crank angle detector (8) detects the position of the engine piston, there is no indication that the detector is used for detecting the direction of movement of the engine piston.

Even if Irie is combined with the teaching of Winkle the combined teachings will not lead to the invention as defined in the present claim 1.

First of all, a combination of Irie with Winkle cannot be effected in the manner proposed by the Examiner because Winkle is non-analogous art and does not relate to lubrication systems for lubricating cylinder faces in large diesel engines. Winkle is non-analogous and should be removed as a reference. Winkle cannot render the present invention obvious because it is neither

in the field of Applicant's endeavor, nor reasonably pertinent to the particular problem with which the Applicant was concerned. Winkle is not in the field of Applicant's endeavor because it is not in the field of lubrication systems as claimed.

Winkle is not reasonably pertinent to the particular problem faced by Applicant. The particular problem solved by the present application is the problem of providing reference sensors for indicating the position of the main shaft and that of the piston. Winkle does not, because of the matter with which it deals, logically commend itself to an inventor's attention in considering this problem. See *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993). No inventor would ever think to look to Winkle for solutions to the problems addressed by the present invention.

Winkle relates to a technology which is used for distributing a fluid such as oil onto a moving strip of sheet material in order to prevent rusting and deterioration and for application of an evenly applied coating, e.g. lubricants necessary for deep drawing or forming operations.

One of ordinary skill in the pertinent art of lubrication systems for large diesel engines will not look into a an unrelated system of lubricating a flat sheet material which is quite different from the cylinders of the diesel engines and which is also used to distribute oil in order to obviate rust or for use in a deep drawing operation. Winkle does teach that a number of pumps (38) are arranged on a manifold (14) which is used for distributing the oil. The pumps (38) are connected to a common shaft (56). Even if column 3 paragraph 2 states that this main shaft (56) can be driven by either a variable speed AC or DC motor mounted to one side of the manifold or by a traction roll and linkage arrangement, yet, Winkle is non-analogous art. Seeing that Winkle discloses an apparatus for distributing liquid there will not be any associated diesel

engine which could be used for driving the shaft of the pumps. This is quite contrary to the technology of Irie in which the diesel engine is always present.

Therefore Winkle has nothing to do with a driving arrangement for the distributing apparatus.

Moreover, it should be noted that Winkle does not disclose reciprocating pumps which are defined by Irie and which should also be used according to the present invention. Seeing that Irie teaches the use of peristaltic pumps (cf. column 6, line 16) there is a reason to believe that a skilled person would not make use of the teaching of Winkle in combination with Irie, seeing that the peristaltic pumps are not used in lubricating systems for lubricating cylinder faces in large diesel engines.

This is a further proof that the skilled would not make a combination of the two documents.

Seeing that Winkle makes use of peristaltic pumps there is no disclosure of an activating means in form of cams which are arranged on a rotating control shaft.

Therefore the AC motor which is disclosed by Winkle is solely a motor which is the central shaft of the peristaltic pump and this is different from the teaching according to the present invention according to which the AC motor is connected with the control shaft which is supporting cams for the reciprocating pumps.

Moreover, Winkle does not teach a main shaft for an engine and therefore reference means which are connected with the main shaft are not disclosed by Winkle. Therefore the reference means which are used for detecting speed, direction of movement and position of the engine piston are neither disclosed by Irie nor by Winkle.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added).

Thus, Irie and Winkle do not teach or suggest all the limitations of Claim 1. Claim 5 depends from Claim 1 and shares its patentable features and adds further patentable limitations. For at least the reasons given above, the rejection of Claims 1 and 5 under 35 U.S.C. 103(a) over Irie in view of Winkle is improper and should be withdrawn.

Claim 4 is patentable under 35 U.S.C. 103(a) over Irie et al (DE 3909772 A1) and Winkle (U.S. Patent 5,698,031) in view of Onuma et al (US Patent 6,058,766), and further in view of Katogi et al. (US Patent 5,945,828).

Claim 4 depends from Claims 1 and 2 and shares their patentable features and adds that the reference means include teeth on a toothed rim that is preferably disposed on the flywheel of the main shaft, and an index reference means, and that the sensor means include an index sensor for detecting the position of the index reference means. As the Examiner allows, Irie and Onuma do not teach or suggest these features.

Recognizing a deficiency in Irie, Winkle, and Onuma, the Examiner relies on Katogi as teaching a reference sensor and malfunction judging unit. However, the Examiner does not explain how those elements relate to the limitations of Claim 4. The office action does not provide any basis for the rejection of each of the features in Claim 4 and therefore applicant is

unable to adequately rebut the rejections. Applicant requests clarification or withdrawal of the rejection. Katogi does not supply the elements of Claim 4, which are not taught or suggested by any reference.

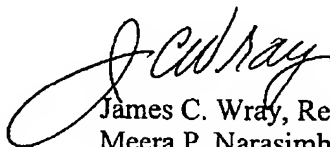
Furthermore, there would be no suggestion or motivation to combine Katogi with Irie, Winkle, and Onuma. Katogi is an engine combustion condition detecting apparatus and has nothing to do with lubrication. While there might be some motivation to combine Katogi with a combustion engine, there would be no motivation to combine it with a lubricating device. No advantage for such a combination can be found in the prior art.

For at least the reasons given above, the rejection of Claim 4 under 35 U.S.C. 103(a) over Irie and Winkle in view of Onuma and further in view of Katogi is improper and should be withdrawn.

CONCLUSION

Reconsideration and notice of allowance are requested.

Respectfully,



James C. Wray, Reg. No. 22,693,
Meera P. Narasimhan, Reg. No. 40,252
1493 Chain Bridge Road, Suite 300
McLean, Virginia 22101
Tel: (703) 442-4800
Fax: (703) 448-7397

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